Pleasant Mountain Quadrangle, Maine

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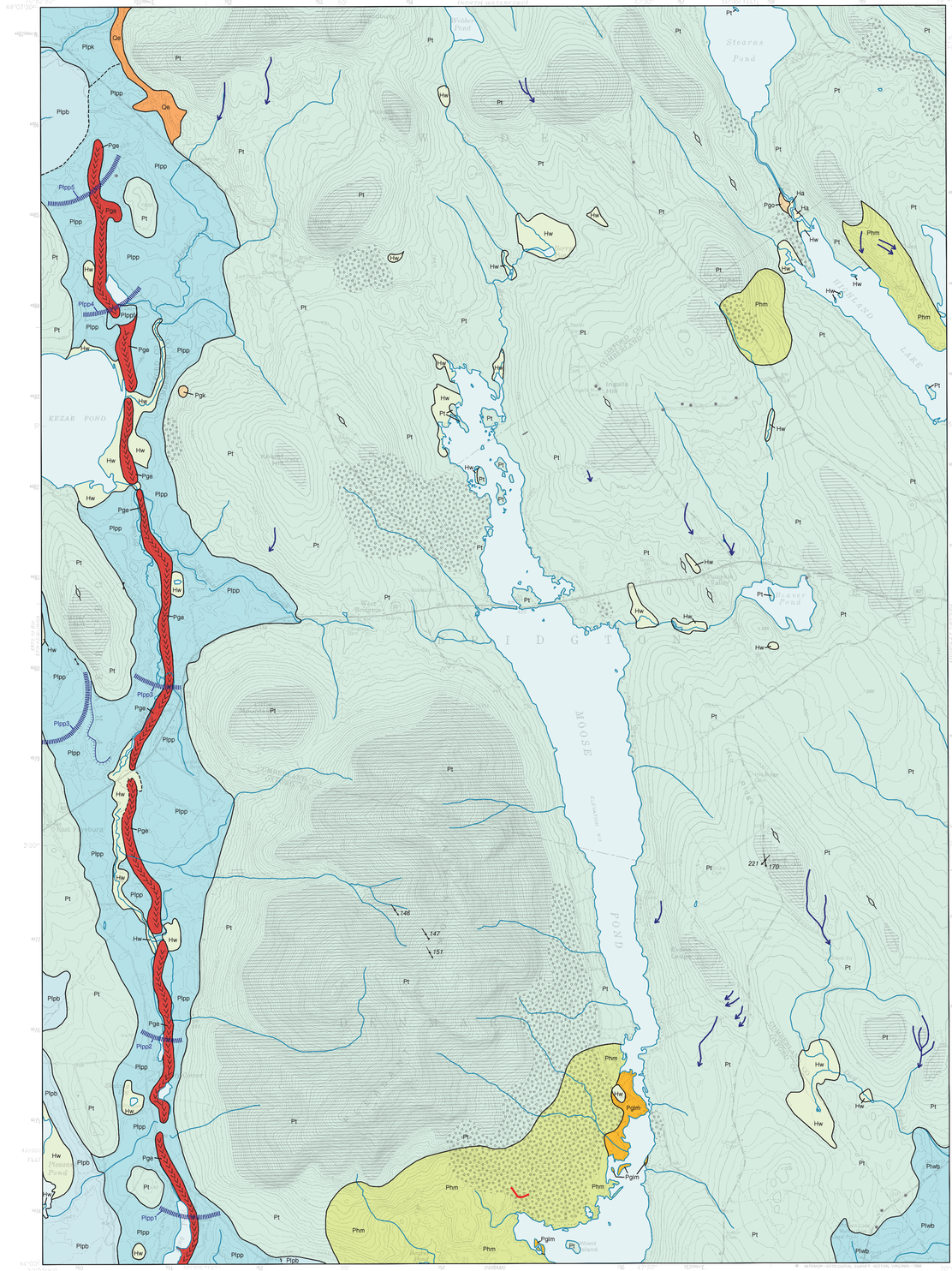
For additional information, see Open-File Report 99-6.

Surficial Geology



SOURCES OF INFORMATION

Surficial geologic mapping of the Pleasant Mtn. quadrangle was conducted by W. B. Thompson in 1976 under funding from the Greater Portland Council of Governments (Cumberland Co. portion), and in 1988 under funding from the MGS. The author updated earlier observations in 1998-1999 to complete this map under funding from the MGS/USGS STATEMAP cooperative.

Quadrangle Location

SCALE 1 : 24,000

1 0 1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 0 1 KILOMETER

CONTOUR INTERVAL 20 FEET

TRUE NORTH

Topographic base from U.S. Geological Survey Pleasant Mountain quadrangle, scale 1:24,000 using standard U.S. Geological Survey topographic map symbols.

The use of industry, firm, or local government names on this map is for location purposes only and does not impute responsibility for any present or potential effects on the natural resources.

Ha - **Alluvium** - Sand, gravel, silt, and organic sediment. Deposited on flood plains of modern streams.

Hw - **Wetland deposits** - Peat, muck, silt, and clay. Deposited in poorly drained areas.

Qe - **Eolian deposits** - Windblown sand. Forms dunes and irregular blanket deposits.

Plpk, Plpp, Plppf, Plpb - **Glacial Lake Pigwacket deposits** - Sand, gravel, and silt deposited in glacial Lake Pigwacket. Includes fan, delta, and lake-bottom sediments.

- **Plpk** - Kezar Valley stage deposits - Formed in an ice-dammed lake that extended up the Kezar River valley (north of the quadrangle).
- **Plpp** - Pleasant Mountain stage deposits - Formed in an ice-dammed lake flanking the esker in western part of the quadrangle.
- **Plppf** - Fan deposited into Pleasant Mountain stage of Lake Pigwacket at mouth of ice tunnel.
- **Plpb** - Lake-bottom deposits.

Pgo - **Outwash deposits** - Outwash sand deposited by glacial meltwater stream in valley between Stearns Pond and Highland Lake.

Pgk - **Kame deposit** - Mound of ice-contact gravel deposited by glacial meltwater on hillside east of Kezar Pond.

Pgim - **Moose Pond deposits** - Ice-contact sand and gravel deposited by glacial outwash streams in the Moose Pond valley.

Plwb - **Willett Brook deposits** - Ice-contact sand and gravel; probably deposited into a glacial lake in the Willett Brook valley.

Pge - **Esker deposits** - Sand and gravel deposited by meltwater streams in a subglacial tunnel system. Unit may also include tunnel-mouth lacustrine fan deposits.

Phm - **Hummocky moraine** - Glacial till with hummocky topography. Consists of poorly sorted rock debris deposited by glacial ice. May contain variable proportions of sand and gravel. Locally very bouldery.

Pt - **Till** - Loose to very compact, poorly sorted, massive to weakly stratified mixture of sand, silt, and gravel-size rock debris deposited by glacial ice. Locally includes lenses of water-laid sand and gravel.

Bedrock outcrops/thin-drift areas - Ruled pattern indicates areas where outcrops are common and/or surficial sediments are generally less than 10 ft thick (mapped partly from air photos). Gray dots show individual outcrops.

Contact - Boundary between map units. Dashed where very approximate.

Scarp - Scarp (delta front?) separating higher and lower depositional levels of glacial Lake Pigwacket sediments.

Ice-margin position - Line shows approximate position of the glacier margin during ice retreat, based on head of outwash for related meltwater deposits. Numbers indicate relative ages; "1" is oldest.

Moraine ridge - Symbol shows trend of moraine ridge in area of hummocky moraine south of Pleasant Mountain. Origin of ridge is unknown.

>>>>> **Esker ridge** - Shows trend of sand and gravel ridge deposited in a meltwater tunnel within or beneath glacial ice. Chevrons indicate direction of meltwater flow.

Glacially streamlined hill - Symbol shows trend of long axis, which is parallel to former glacial ice-flow direction.

135 **Glacial striation locality** - Arrow shows ice-flow direction inferred from striations on bedrock. Dot marks point of observation.

Dip of cross-bedding - Arrow shows average dip direction of cross-bedding in fluvial or deltaic deposits, which indicates direction of stream flow or delta progradation. Point of observation at dot.

Meltwater channel - Channel eroded by glacial meltwater stream. Arrow shows inferred direction of former stream flow.

Area of many large boulders

USES OF SURFICIAL GEOLOGY MAPS

A surficial geology map shows all the loose materials such as till (commonly called hardpan), sand and gravel, or clay, which overlie solid ledge (bedrock). Bedrock outcrops and areas of abundant bedrock outcrops are shown on the map, but varieties of the bedrock are not distinguished (refer to bedrock geology map). Most of the surficial materials are deposits formed by glacial and deglacial processes during the last stage of continental glaciation, which began about 25,000 years ago. The remainder of the surficial deposits are the products of postglacial geologic processes, such as river floodplains, or are attributed to human activity, such as fill or other land-modifying features.

The map shows the areal distribution of the different types of glacial features, deposits, and landforms as described in the map explanation. Features such as striations and moraines can be used to reconstruct the movement and position of the glacier and its margin, especially as the ice sheet melted. Other ancient features include shorelines and deposits of glacial lakes or the glacial sea, now long gone from the state. This glacial geologic history of the quadrangle is useful to the larger understanding of past earth climate, and how our region of the world underwent recent geologically significant climatic and environmental changes. We may then be able to use this knowledge in anticipation of future similar changes for long-term planning efforts, such as coastal development or waste disposal.

Surficial geology maps are often best used in conjunction with related maps such as surficial materials maps or significant sand and gravel aquifer maps for anyone wanting to know what lies beneath the land surface. For example, these maps may aid in the search for water supplies, or economically important deposits such as sand and gravel for aggregate or clay for bricks or pottery. Environmental issues such as the location of a suitable landfill site or the possible spread of contaminants are directly related to surficial geology. Construction projects such as locating new roads, excavating foundations, or siting new homes may be better planned with a good knowledge of the surficial geology of the site. Refer to the list of related publications below.

OTHER SOURCES OF INFORMATION

1. Thompson, W. B., 1999, Surficial geology of the Pleasant Mountain 7.5-minute quadrangle, Oxford and Cumberland Counties, Maine: Maine Geological Survey, Open-File Report 99-6, 9 p.
2. Thompson, W. B., 1998, Surficial materials of the Pleasant Mountain quadrangle, Maine: Maine Geological Survey, Open-File Map 98-227.
3. Neil, C. D., 1998, Significant sand and gravel aquifers of the Pleasant Mountain quadrangle, Maine: Maine Geological Survey, Open-File Map 98-194.
4. Thompson, W. B., 1979, Surficial geology handbook for coastal Maine: Maine Geological Survey, 68 p. (out of print)
5. Thompson, W. B., and Borns, H. W., Jr., 1985, Surficial geologic map of Maine: Maine Geological Survey, scale 1:500,000.
6. Thompson, W. B., Crossen, K. J., Borns, H. W., Jr., and Andersen, B. G., 1989, Glaciomarine deltas of Maine and their relation to late Pleistocene-Holocene crustal movements, *in* Anderson, W. A., and Borns, H. W., Jr. (eds.), Neotectonics of Maine: Maine Geological Survey, Bulletin 40, p. 43-67.